umberland and Durham,' in which 164 species are recorded for the north-eastern district against 265 for the south-western.

The species contained in this Catalogue and Supplement are thus distributed amongst the various groups:—

Hydrozoa	Hydroida	92		
	Discophora (Lucernariidæ)	2		
		—	94	
Actinozoa	Zoantharia = Coralligena (*Huxley*)	37		
	Alcyonaria	4		
		—	41	
Polyzoa	Cheilostomata	87		
	Cyclostomata	16		
	Ctenostomata	17		
	Paludicellea	1		
	Pedicellinea	3		
	Lophopea	6		
		—	130	
			265	

EXPLANATION OF THE PLATES.

Plate V.

Fig. 1. *Gymnocoryne coronata*, Hincks, highly magnified: 1 *a*, the circle of oral tentacles.

Fig. 2. *Lovénella clausa*, Lovén, with gonotheca, magnified: 2 *a*, the gonozooid; 2 *b*, the same, seen from below.

Plate VI.

Fig. 1. *Campanularia calceolifera*, Hincks, nat. size.

Fig. 2. A portion of a shoot, magnified.

Fig. 3. A gonotheca, magnified, to show the internal structure: *x*, the internal tubular orifice; *y*, the point of exit.

Fig. 4. Another gonotheca.

Fig. 5. The upper portion of a gonotheca, more highly magnified, showing a planule escaping through the tubular orifice.

Fig. 6. A gonophore, highly magnified.

X.—*Notes on* Trionyx Phayrei *of* Mr. Theobald *and* Dr. Anderson. By Dr. J. E. Gray, F.R.S. &c.

There seems an unfortunate fatality attending the tortoises named after Lieut.-Col. Sir A. P. Phayre, late Chief Commissioner of British Birma. Mr. Blyth named a *Testudo* after him which has caused much controversy. Mr. W. Theobald, in a paper published in the 'Journal of the Linnean Society'

for 1868 (vol. x. p. 18), named after him a species of *Trionyx*, thus :—

"*Trionyx Phayrei*, Theobald.

"Capite typico, faciali forma forsan rotundiore. Sterni sculptura modica, sive reticulationibus minoribus quam in *T. gangetico*. Sculptura ad latus regulariter reticulata, sed vertebrali regione post secundas costas parum dilatata sive incrassata. Thorace valde cartilagineo, vix ullis (præter ad latus) tuberculis osseis armato. Colore supra olivaceo, lineis fuscis eleganter marmorato, subter flavescente pallido.

"*Habitat* in fluminibus montium Arakanensium, prope Bassein."

The Latin appears to be a translation of the following observations :—

"Granulation of sternum not very coarse, less so than in *T. gangeticus*, on the sides regular, but coarser and larger along the centre of the back behind the second pair of ribs. Thorax highly cartilaginous, and almost devoid of bony callosities save at the margin, where the granulations are slightly developed. Colour during life dark dull brown, handsomely lined, as in Günther's figure, *l. c.*; below yellowish white. Captured in a hill-stream on the Arakan hills in the Bassein district."

It is curious that in both these descriptions Mr. Theobald has mistaken the thorax for the sternum, and the sternum for the thorax; unless this is so, these descriptions are not intelligible or consistent with the following observations :—

"This is a somewhat aberrant species in some respects, and was at first confounded by me with *Chitra indica* of Günther's Monograph, from the precise resemblance which the marbling of the upper part bore to that figure. Since, however, examining the specimens in the British Museum, I find that the animals are very different. The true *Chitra* of Gray (Proc. Zool. Soc. Feb. 23, 1864, p. 17) does not, to my knowledge, occur in Birma. The *Chitra indica* figured in Günther's monograph is, on the authority of Dr. Gray, his *Pelochelys Cantori*. The skull of the present species cannot readily be distinguished from that of *T. gangeticus*, though to my view it seems more arched, and rounded in profile. The thorax resembles that of *T. gangeticus*; but the sternum *presents a remarkable difference in the development of the bony plates, and more nearly, in general characters, approaches to* Dogania subplana, *Gray. The osseous tubercular surface, however, is less developed and more feebly sculptured* (the age and size of the specimen considered) *than in any of its allies*, and at a glance serves to discriminate the present species from them.

"*a*. Adult. Length 21 inches, breadth 14½ inches; length of osseous sternum 12½ inches."

It appears that Mr. Theobald only obtained one specimen, which he informed me he gave to the Bristol Museum; so that Dr. Anderson cannot have a better means of determining this species than the above description affords. Mr. Theobald showed me his specimen as *Chitra indica*, and I was quite unable to decide, in the dried state, to what Asiatic species it belonged, as the skull was enclosed and could not be examined, and the animals vary so little in their external appearance when they have lost the characteristic markings of their coloration, which only can be observed in their young state. The great resemblance in their external appearance is manifest from the fact that Mr. Theobald compares it with such distinct things as *Trionyx gangeticus*, *Dogania subplana*, *Chitra indica*, and *Pelochelys Cantori*, belonging to two families of very different structure and habits.

But the chief character that he seems to rely upon as the characteristic of the species is the part of the above description which I have marked in italics, *i. e.* the slight development of the sternal callosities.

Dr. Anderson, in the 'Proceedings of the Zoological Society,' 1871, p. 154, describes a species he calls *Trionyx Phayrei*, observing that "the chief differences that separate it from *T. gangeticus* are the less developed character of the osseous portion of the sternum, and the relatively finer character of its sculpturing on both aspects." He gives a figure of the sternum, which does not accord with this remark, but represents it as having not only large and well-developed lateral callosities, not in the slightest degree resembling the small narrow linear lateral callosities found in *Dogania* as described by Mr. Theobald, but also having large triangular anal callosities and the odd osseous semicircular bone in the front of the sternum covered with a lunate callosity not even found in *Trionyx gangeticus*; so that this animal can have no connexion with the species described by Mr. Theobald, except that it comes from a nearly similar part of Hindostan. But, unfortunately, that is no criterion of their identity, as many species of *Trionycidæ* and *Chitradæ* are found in that district, as has been proved by Cantor and Mr. Theobald himself. The fact is, that the specimen described by Dr. Anderson is a specimen of my genus *Landemania*, and probably the species which has been named *L. perocellatus*.

I know how much the sternal callosities change during growth; but a person who has examined many species of the three-toed tortoises in different stages can form a very good

opinion on the form which the callosities found on a young specimen will assume when it becomes adult; and I never saw a lateral linear callosity like that of *Dogania*, which Mr. Theobald says his species possesses, become a broad callosity, dilated at each end like that figured by Dr. Anderson; and Mr. Theobald does not mention any anal callosities as found in his specimen, which we must recollect, from its size and the state of its coloration, must have been half-grown, if not an adult animal. And therefore I cannot believe that it would have the large triangular anal callosities occurring in Dr. Anderson's figure. Species that have such a callosity generally have a small circular callosity even in their youngest state; and therefore I conclude, from all these characters, that the *Trionyx Phayrei* of Dr. Anderson has no affinity with the animal described under that name by Mr. Theobald.

Dr. Anderson objects to the genus *Sciurus* being separated into genera by organic characters, such as the shape of the skull and the pencilling of the ears (Proc. Zool. Soc. 1871, p. 139), but prefers dividing them, according to their colouring, into lineated grizzled squirrels and dorsal lineated squirrels, and lateral lineated squirrels and ventrilineated or (as he calls it in another place) belly-banded squirrels. To my mind this is a retrograde movement rather than an advance in zoological science. I see no objection to a man refusing to adopt the new generic names; but when a genus has been divided by organic characters founded on the examination of a large series of species, including a large collection of specimens, it certainly is an advantage to use those divisions as sections of a genus, or at least to take care, in describing the species, that the characters on which these divisions are founded are carefully examined and fully described. If Mr. Theobald and Dr. Anderson had availed themselves of the characters afforded by the skulls and the development of the callosities of the mud or three-toed tortoises, and had referred the specimens they described to the sections so proposed (although they did not adopt the genera or subgenera), they would not have left the species they described in such doubt, or they would not have referred two species so evidently unlike to the same name. But then I know that it is not easy to do this when the describer depends on Indian drawings for his materials. I can only understand Dr. Anderson's remarks on the species of squirrels by his attention being confined to external appearances as represented in figures; and we may judge of the kind of inartistic figures he has to work from by the plate of *Sciurus quinquestriatus* which he has published (Proc. Zool. Soc. 1871, pl. 10).

Dr. Anderson says he has carefully compared the skull of his specimen of *Trionyx Phayrei* with that in the British Museum which is named *Trionyx Jeudii*, and he cannot detect any characters to separate the two. I regret that, as he seems to have had the skull in England to compare, he did not show it to me, who am so well acquainted with the skulls of the genus.

The papers of Dr. Anderson in the 'Proceedings of the Zoological Society' for 1871 do not give one a very high opinion of the state of zoological knowledge in the Imperial Museum at Calcutta*. They all belong to what Prof. Edward Forbes used to call the school of zoology that regarded animals as skins stuffed with straw; for they contain no reference to any points in the internal structure or economy of the animals described, indeed little but the details of the species that can be derived from the inspection of figures made by a native artist, who merely copies what he thinks he sees—which is the more extraordinary, as Dr. Anderson, besides being Director of the Imperial Museum at Calcutta, is Professor of Comparative Anatomy of the Medical College of that city. He has been shown that the form of the skull, the form of the palate, and the structure of the alveolar surface of the jaws form very important characters for the distinction of the species of the genus *Trionyx* in its widest sense; yet here we have a description of a doubtful species in which none of these points are mentioned; and the only particulars of the species which he gives (for Dr. Anderson does not undertake to give specific characters) are measurements of the different parts, which are given in such a way that one cannot understand whether they are intended for inches and lines or for inches and tenths; and one is not helped by consulting his other papers, where he appears to use a different system. The sternum is thus described:—"*Seven* osseous plates, of which

* Dr. Anderson, as Director, claims the monopoly of describing and naming; for he observes:—"I cannot allow Dr. Jerdon's statement that he had my permission to describe and name this lizard to pass without comment. I placed the museum collection of reptiles at Dr. Jerdon's disposal for comparison; but I certainly never contemplated that he would make use of the confidence I reposed in him to describe this lizard without my sanction." (Proc. Zool. Soc. 1871, p. 156.) This regulation is neither advantageous to the study of zoology, the advancement of the collection, nor to the scientific knowledge of the curator, as it prevents healthy competition. For the last half-century that I have been connected with the British Museum, every one (native or foreign) has had full permission to use any of the zoological specimens as if they were his own, on the simple condition that he does not injure them or render them less useful to his successors; and this principle has certainly worked well for science and for the collection.

five are visible and granular," which I suppose means the *nine* bones of which the sternum of all *Trionyces* or mud-tortoises (and, indeed, of all Testudinata) is formed: thus he does not seem to be aware that what he calls the abdominal plates are each formed of two bones, as he may see if he will only consult Cuvier on the osteology of tortoises, in his 'Ossemens Fossiles,' vol. v. p. 204. He goes on to describe the odd osseous plate as "semicircular, 7″ 5‴ along the curve, and 1″ 3‴ in diameter in the mesial line; anteriorly in contact with the anterior pair, and posteriorly with the abdominal ones,"—a very important observation; for, as Cuvier observes, Geoffroy describes the sternum as composed of nine bones, of which eight are in pairs and the ninth is odd and placed constantly between the four anterior ones, with the first two of which it adheres in preference when it is not attached to the four. Then follows:—"The greatest length of the abdominal plates is 8″; they enclose an hourglass-shaped cartilaginous area, the anterior portion being the largest, and measuring 4″ 3‴ in diameter and 6″ 8‴ in length from the posterior contraction to the odd plate." Thus you either only have the general character of the order or the measurements of parts and the shape of parts, as the cartilaginous area of the sternum, given as the character of the species, which are liable to vary in the different stages of growth of the same specimen.

It would have been very useful if Dr. Anderson, instead of criticising the works of other naturalists, and altering the names because they are not in accordance with his idea of euphony, and describing individual specimens as species, had studied the changes that occur in the sternal callosities, the dorsal disk, and other variations that do take place in the growth of the *Trionyces*, which has made them so difficult to understand by European naturalists who have had but a few specimens in the museums to examine, but which at great labour I have attempted in my various papers to unravel; for he lives in a country where certainly some species of the genus are abundant, and where they are to be obtained in the markets, or certainly from the fishermen, with very little labour; and it would be very useful if a person having such advantages would controvert or confirm the observations I have made. Had he pursued such a study, which is quite consistent with the post he occupies, I am certain he would not have confounded his specimen (which is, as I say, a *Landemania*, according to my division of the family) with the *Trionyx Phayrei* of Theobald, which is most probably an *Aspilus* or *Dogania*. And I consider such observations of far greater importance to science than determining whether the

animal is to be called *Trionyx Phayrei* or *T. Jeudii*; for fortunately the study of zoology is not all confined to the study of nomenclature, which is but a means to enable us to determine with some certainty the species on which one's observations on structure, development, habits, and economy may be recorded.

XI.—*Additions to the Australian* Curculionidæ. Part I.

By Francis P. Pascoe, F.L.S. &c.

Five or six years ago our knowledge of the Australian Curculionidæ was comparatively in a not much more advanced state than it was left in by Schönherr* in 1845. This author was acquainted with 229 species, including 10 from Tasmania. Erichson, however, in 1842 (Archiv für Naturgeschichte) had published 41 species, which were not noticed by Schönherr. In 1848, Germar (Linnæa Entomologica) added 24 to the list. The number was slightly increased by Mr. Waterhouse in 1853–54 and 1861 (Trans. Entomolog. Soc.), by Boheman in 1858 (Eugenies Resa), and by M. Jekel in 1860 (Insecta Saundersiana). In 1865, Mr. W. MacLeay published a very large number of species belonging to the subfamily Amycterinæ, in the 'Transactions of the Entomological Society of New South Wales.' Hope, Blanchard, Perroud, Roelofs, and, in 1867, Redtenbacher (Novara-Reise) may be mentioned as having contributed a few more. Many new genera and species have been recently described by me in the 'Journal of the Linnean Society' and elsewhere; so that now we may reckon upon about 730 species. There are still, however, a great many species new to science in my collection, and, thanks to some of my friends in Australia, especially Mr. Masters, of Sydney, and Mr. Odewahn, of Gawler, I am frequently adding to the number. I purpose publishing some of these occasionally in

* 'Genera et Species Curculionidum.' This elaborate work, in eight volumes, each of two parts (volumes in themselves), included the Bruchidæ, Brenthidæ, and Anthribidæ, as well as the Curculionidæ. The latter amounted to 6335 species (the whole number was 7141), and were described by Boheman, Gyllenhall, Fahræus, and Rosenschöld, Schönherr only reserving to himself the descriptions of the genera. It is very usual to quote Schönherr only, but I have invariably quoted the authors whose names followed the specific descriptions. In the 229 species mentioned above, about 10 should be subtracted for Bruchidæ, Brenthidæ, and Anthribidæ. Rather more than 20 species of these families are now known from Australia.